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Exploring the Relationship between Team Characteristics and Mental Health Symptoms amongst
Student Athletes

An Honors College Project Presented to
the Faculty of the Undergraduate
College of Health Sciences
James Madison University

by Dylan Owens

April 2018

Accepted by the faculty of the Department of Health Sciences, James Madison University, in partial fulfillment of the requirements for the Honors College.

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PUBLIC PRESENTATION

This work is accepted for presentation, in part or in full, at The Honors Symposium on 4/18/18.

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Abstract

Depression and anxiety are disabling conditions that are particularly prevalent amongst young adults (Wolanin, Hong, Marks, Panchoo, & Gross, 2016). Student athletes must cope with extensive time demands that go beyond those of ordinary young adults, consequently putting them at increased risk to experiencing mental health issues. Numerous factors may influence an athlete's well being, such as gender, injury, and type of sport. This study tests these various factors but also extends previous literature by analyzing the effects of team dynamics on student athlete mental health. An anonymous multi-part questionnaire was sent out to all JMU athletes in the Fall of 2017. Chi square statistical tests were used to determine whether there was a mathematical association between team characteristics and the presence or absence of mental health symptoms. There was a significant correlation between 'pressure' and anxiety ($X^2 = 13.403$, $p = .009$). In addition, 'inability to trust teammates' and 'not sharing goals of personal improvement' also contributed to increased levels of anxiety. There was a significant correlation between serious injuries and depression ($X^2 = 4.325$, $p = .038$). Lack of time for social life and inability to effectively manage conflicts within the team both contributed to increased levels of depression as well. Fortunately, the data showed that JMU's student athletes had higher mental health scores than American college students as a whole, according to prior research, and they do feel as though the resources available to them are adequate.

Background

Depression and anxiety are prevalent and disabling conditions that have been recognized as one of the most important health-care priorities in the United States today (Healthy People 2020, 2014). Symptoms of depression include sadness, energy loss, change in weight, insomnia, excessive sleeping, loss of interest or pleasure, difficulty concentrating, feelings of

worthlessness, excessive guilt and recurrent thoughts of death or suicide (American Psychological Association, 2017). Symptoms of anxiety include intrusive thoughts or concerns, feelings of tension, and physical changes such as sweating, trembling, dizziness, rapid heartbeat, and increased blood pressure (American Psychological Association, 2017). Mental health conditions are the leading cause of disability in the United States, accounting for the largest proportion of all years lost to disability and premature mortality (Murray et al, 2013). Each year in the United States nearly a fifth of all adults over the age of 18 experience any mental health issue, with 4.2% of those suffering from a seriously debilitating mental health issue (Hedden, Kennet, Lipari, Medley, & Tice, 2014).

Young adulthood (ages 18-26) is an important developmental period in an individual's life, having a lasting impact on their health and wellbeing. However, young adults face particular challenges, responsibilities, and obligations (Bonnie, Stroud, & Briener, 2015). A significant subset of young adults are at risk for experiencing acute emotional distress and the onset of major mental health disorders, and therefore are in need of support in coping with these stressful circumstances (Garcia, 2010). The prevalence of depression for young adults is already higher than that of other age groups (Wolanin, Hong, Marks, Panchoo, & Gross, 2016). In a twelve-month period, 65% of respondents to an American College Health Association survey of college students reported feeling very sad, 58.4% reported feeling overwhelming anxiety, and 9.8% had seriously considered suicide (American College Health Association, 2016). Of the students surveyed, 6.1% participated in varsity college athletics (American College Health Association, 2016). Despite this importance, young adults face specific barriers to being screened for preventive health concerns (Ozer, Urquhart, Brindis, Park, & Irwin, 2012). Therefore, it is

important to identify populations of young adults who may be at risk for poor mental health outcomes, in order to provide resources and support for.

Student-athletes are an important demographic subset of young adults because they must balance the roles of being both a full-time student and full-time athlete.

The National Collegiate Athletic Association (NCAA) encompasses over 380,000 athletes participating in twenty-three sports at more than 1000 institutions- representing a wide range of students across the entire country (Thompson & Trattner Sherman, 2007). College athletic departments have often been criticized as being driven by publicity and revenue gains, with universities investing heavily in developing programs, coaches, and facilities, while at the same time not putting as many resources into the intellectual development or wellbeing of their athletes (Kissinger & Miller, 2009).

Student athletes must cope with public scrutiny and extensive time demands on top of regular classwork, often investing over thirty hours a week in their sport while still having to achieve a GPA of 2.0 or higher to maintain their NCAA eligibility and meet the expectations or requirements of their specific coach or team (Carodine, Almond, & Gratto, 2002). In addition, many athletes arrive with already lower entrance scores and poor high school grade point averages, putting them at academic disadvantage, while facing significant time commitments, physically grueling workouts, and demanding expectations (Carodine, Almond, & Gratto, 2002). Athletes are often unable to manage their own academic schedules and social lives. They practice, workout, study, and often live together. Because of these similar scheduling restrictions, they frequently take courses at the same time and wind up segregating themselves from the general student population (Carodine, Almond, & Gratto, 2002). Being unable to pursue other interests, athletes may feel resentment towards their sport or unsatisfied about their quality of

life. They may also have coaches that expect them to put their sport first, even to the detriment of their own academic success. It is no wonder the majority of student athletes reported that the demands of intercollegiate athletic training and competition have prevented them from being able to devote as much time to the student side of their lives as they would like (Jolly, 2007). Between performance pressure, lack of sleep, missing classes for competition, handling team tensions, and balancing schoolwork, student-athletes possess responsibilities that often go far beyond that of a regular student (Kamusoko & Pemberton, 2012). Poor performance in one's sport can affect an athlete's relationship with their coach, poor academic performance can bar them from being able to compete, and poor social behavior (such as an un-exemplary social media post) can put their scholarship on the line (Carodine, Almond, & Gratto, 2002). Because of this, they may be particularly prone to experiencing mental health issues such as depression and anxiety.

Mental health can arguably be considered the most important health and safety issue facing student athletes today. With stressors far beyond that of the general student body, student athletes are consequently at risk for experiencing serious mental health problems (Kamusoko & Pemberton, 2012). In a study of 257 NCAA athletes, 21% reported experiencing symptoms of depression (Yang et al, 2007). Yet, despite being at risk for psychological issues, student athletes may also be resistant to disclosing them, possibly because of a fear of disappointing their coach or teammates.

In addition to time constraints, medical problems, such as an injury or illness, often have serious psychological and emotional consequences, as the student athlete's self-esteem and identity may become negatively affected by their inability to play their sport (Thompson & Trattner Sherman, 2007). Physically injured athletes experience a period of emotional distress

that in some cases may be severe enough to warrant clinical intervention (Nixdorf, Frank, & Beckmann, 2016). Research also indicates that athletes who incurred a significant time-loss injury experienced greater negative life changes in the previous twelve months than non-injured players (Passer & Seese, 2010).

Sex is a huge factor because men and women differ greatly psychologically and behaviorally due to differences in neuroanatomy and neurochemistry (Ngun, Gharahmani, Sanchez, Bocklandt, & Vilain, 2011). Male and females deal differently with coaches, teammates, training schedules, and other team related factors as well as reacting to stress differently. Women use more emotion-focused strategies and men use more problem-focused strategies when attempting to reduce stress (Giuriu & Damian, 2015). The prevalence rate for clinically relevant depressive symptoms was 23.7%, with female athletes exhibiting 1.8 times the risk of male athletes for depression (Wolanin, Hong, Marks, Panchoo, & Gross, 2016). Previous research suggests that female, freshman athletes with self-reported pain were associated with significantly increased odds of experiencing depressive symptoms (Yang et al, 2007).

In addition to sex and injury, the type of sport may be indicative of mental health outcomes. Research shows that athletes in individual sports had higher scores in depressive symptoms than athletes in team sports (Nixdorf, Frank, & Beckmann, 2016). Depression in athletes is associated with to specific sport-specific factors, such as injury, overtraining, exceeding stress, or failure in competition (Nixdorf, Frank, & Beckman). Athletes competing in track and field had the highest rate of depression scores, whereas lacrosse players had significantly lower levels. This supports the assumption that higher depression scores are found in disciplines with competition based mainly on individual performance (Nixdorf, Frank, & Beckmann, 2016). Individual-sport athletes may feel more internal attribution of failure, as they

do not have teammates who can be credited or blamed for poor results, whereas in team sports, responsibilities can often be diffused.

Mental health is a crucial aspect for student athletes because levels of anxiety, self-confidence, and mood disturbance affect athletic performance and success (Covassin, 2004). If programs are not checking in with the mental health of their individual athletes, they are hurting the success of their team as a whole. Results from a 2014 study on student athlete wellness indicate that an integrative outreach model that incorporates mental health education, sport psychology concepts, and mental skill techniques, can be an effective strategy to increase athlete awareness of support systems, reduce stigma, and develop self-care skills (Beauchemin, 2014). A long term goal of the study may be to analyze the existing support systems at JMU and their effectiveness, as well as whether they use or could benefit from the integrative outreach model described in the aforementioned study. While plenty of research exists on certain characteristics affecting athlete mental health, such as gender, injury, and type of sport, there is significantly less in the area of team dynamics, including the athletes relationship with both their coach and their teammates. This research attempts to fill a very important gap in the literature about characteristics affecting athlete's wellbeing.

Study Design & Methods

This study considered the association between team dynamics and experience of depression and anxiety amongst student athletes on different sports teams at James Madison University. Methodology utilized an anonymous survey, created in Qualtrics that was sent via email to male and female athletes across all sports who attend JMU during the fall semester of 2017. Student athletes were identified from team rosters listed on the JMU athletics website.

These students are all considered NCAA Division I athletes and are therefore subject to all NCAA rules, such as eligibility based on academic standing, drug testing, gambling etc. First, coaches of the athletes were contacted through an e-mail asking for their permission to send the questionnaire out to each player (Appendix A). Upon recruitment, players were contacted directly via a separate e-mail (Appendix B) and invited to participate in an online Qualtrics survey. Survey questions (Appendix C) were developed in such a way that participants could not be made identifiable given their answers. Upon conclusion of the original questionnaire, participants were given the URL to a separate Qualtrics form to provide their contact information for the chance to win the \$25 gift card for their participation.

Analysis sought to determine whether there was a mathematical association between the main exposures of team characteristics and the outcome of presence of mental health symptoms. In addition to the main exposures of team characteristics and the outcomes of depressive and anxiety symptoms, the survey also collected information about other key factors such as gender, sport type, athlete-coach relationship, and intensity of the training/travel schedule, examining how these variables mediate student athlete mental health and wellbeing. The survey also considered available support services as well as other coping mechanisms, with the ultimate goal to use the findings to improve support systems and promote wellbeing among this population of student athletes.

Scores for depression and anxiety were calculating using screenings from *Mental Health America*, a nonprofit dedicated to addressing the needs of those living with mental illness in our country (Mental Health America, 2018). The scales were designed by a group of mental health experts as screening tools for anxiety and depressive symptoms, making them an appropriate measure. Questions in each of these scales asked how often the respondent experienced a

specific symptom of either anxiety or depression over the previous two weeks. There were nine depressive symptoms and seven anxiety symptoms. Examples of depressive symptoms include little energy, poor appetite, and suicidal thoughts. Examples of anxiety symptoms include feeling restless or afraid. The answer options were listed on a four point Likert scale: not at all, several days, more than half the days, nearly every day.

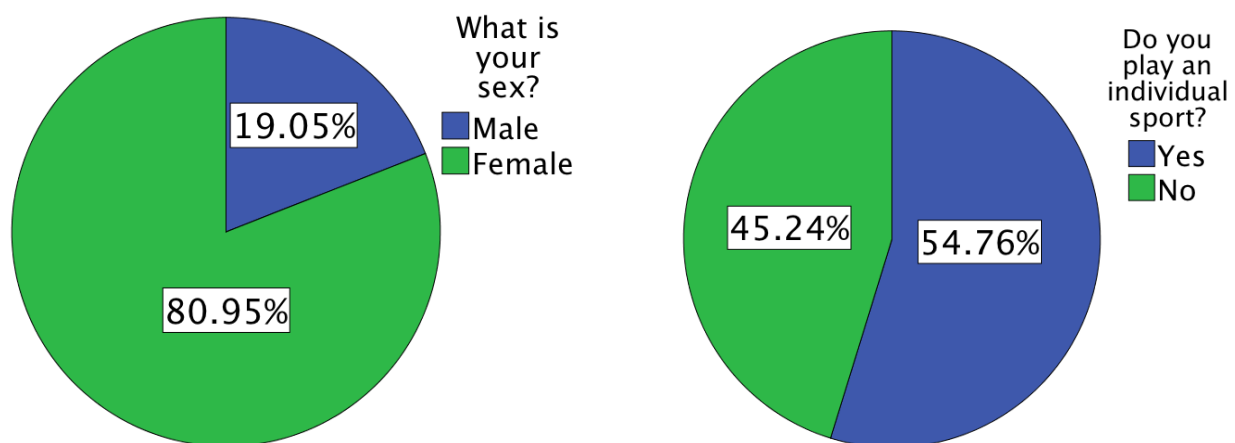
Analysis

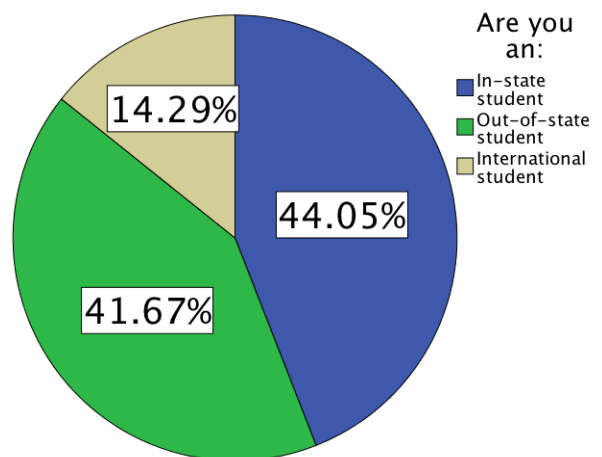
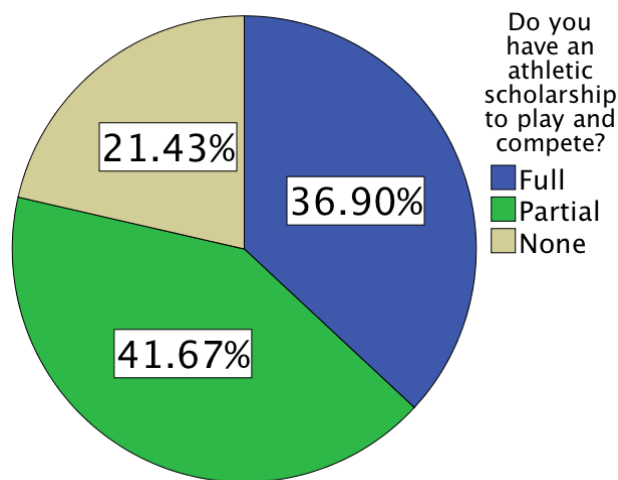
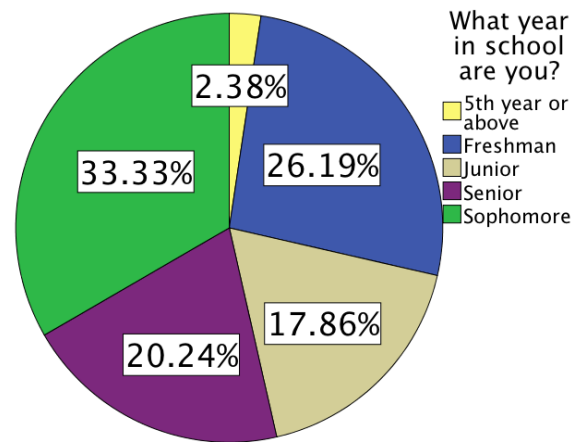
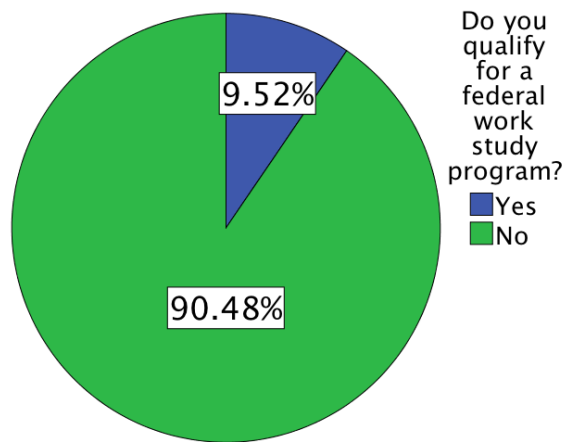
The multi-part questionnaire assessed depressive and anxiety symptoms against independent variables that could be categorized into four different sections: individual characteristics, academic characteristics, team dynamics, and student athlete or sport-related characteristics. Descriptive statistics were used to measure frequencies of the demographics of the sample population, including mean, median, and mode. Bivariate statistics were used to make comparison between groups of people, for example males and females or between team and individual sports. Finally, chi square tests were used to determine whether there were mathematical associations between team characteristics and the presence or absence of mental health symptoms in participant athletes.

Although every student athlete that played during the fall semester (N=433) of 2017 was emailed the survey and invited to participate, 100 gave consent to participate in the study. Of those, 84 completed the questionnaire and were used as the analytic sample. However, demographic differences between those who did and did not complete the survey were examined in order to determine that there were no significant differences between these two groups, and there were not. This is important because major discrepancies between them could have lead to potential response bias.

Of the analytic sample, 16 (19%) were male and 68(81%) were female. Sixty-nine (82%) of the students described themselves as white and 15 (18%) identified as non-white. Of the athletes, 8 (10%) qualified for a federal work-study program and 76 (90%) did not. There were 37(44%) in state individuals, 35(42%) were out-of-state, and 12(14%) were international students. There were a total of 22(27%) freshmen, 28(33%) sophomores, 15(18%) juniors, 17(20%) seniors, and 2(2%) that were 5th year students or above. In total, 31(37%) had a full athletic scholarship to play and compete. Thirty-five (42%) had a partial scholarship, and 18(21%) did not have one at all. Demographics can be found in Figure 1.

Figure 1. Demographic and Academic Characteristics: Sex, Participation in Individual Sport, Work Study Qualification, Year in School, Athletic Scholarship, State Residency





The amount of hours spent studying per week varied greatly among the respondents, with a low of 3 hours to a few outliers giving responses as high as 45 hours. The most common number given for the data was about 15 hours. A majority (58) of the athletes utilized the tutoring serviced provided specifically for them. Of those who did, a majority (28) met with the tutors at least once a week. The most common number for the amount of hours spent training per week was 20 hours. This includes both skills practice and lift/conditioning sessions. Participants reported that they trained between 2 and 5 hours each day. Forty-three out of the 84 respondents said their practices were “always physically demanding” in terms of physical exertion. Only 7

said that they were always given enough time to rest and recover from practice, only 8 said they were always given enough time to rest and recover from travel, and only 12 said they were always given enough time to rest and recover from competition.

Of the respondents, only 5 athletes felt as though they had enough time for a social life. Forty students said they always felt pressure being a student athlete, and 21 said they usually did. Only 2 of the total respondents said they never felt pressure. Of the 84 respondents, a majority of the students (46) had experienced significant injuries that impacted their ability to play. Of these, 96% of these injuries resulted in time away from their sport. Seventeen were injured for 1-4 weeks, 13 for 3-6 months, and 12 for 7-12 months. Of the 46 participants who had experienced an injury, 28 said their injuries did cause them emotional distress. Those who did experience emotional distress were asked to explain in what ways they felt as though their injury has affected them. Responses to this were grouped into categories of frustration, change, depression, lowered confidence, stress, and newfound appreciation.

Frustration was a common feeling amongst student athletes whose injuries barred them from being able to play their sports and contribute to the successes of their team. Students reported feelings of helplessness, as they were unable to improve alongside their peers. After training hard during the off-season, students felt as though their work did not pay off. One student said: “When I came back to competition it made me feel like all my teammates had a huge advantage over me (even when I was back in shape) and that feeling has carried on with me through my 3 years at JMU” (female student athlete, junior). Another student reported that the injury made them feel as though they were stuck in time. Frustration also occurred when athletes had to change their game or playing style, forcing them to overcome limitations and putting them at a disadvantage against opponents. Another theme noted by student responses was depression.

These are athletes whose mental/emotional wellbeing was negatively affected by their injury. Different students reported that their ordeal was “emotionally draining,” made them feel a “lack of purpose,” and caused them not to feel like themselves anymore. Many athletes began to doubt their skills and abilities. One said, “I wanted to quit my sport and go home. [The injury] made me feel like I wasn’t good enough to play” (female student athlete, sophomore).

In addition to frustration and depression, students also emphasized that their injury caused them a lot of stress. Their anxiety stemmed from a variety of different things. One student was injured while in the process of transferring schools, and reported that finding a coach who was willing to recruit a player with a cast was extremely stressful. Other students reported that their injury affected them in the classroom as well, either directly from the stress of not playing, or due to missing class time for surgery, causing them to miss important information and fall behind. In addition, many had fear of getting injured again upon recovery, or exacerbating their existing injury. One student said, “I was forced to play even when it made my injury worse. I was scared to talk to my coach, afraid of him not understanding the fact that it was pain and not soreness.” With answers like these, it is easy to understand how injuries, especially those that resulted in time away from sport, could lead to poor mental health outcomes. While most reports on injury were about emotional anxiety, frustration, and distress, there were a few who mentioned developing newfound gratitude and appreciation for their sport and ability to play. One even said, “[the injury] made me have deeper appreciation for our trainers and showed me how important treatment is.” Another said, “it made me want to be a better athlete.

Of the 84 respondents, only 15 have utilized JMU’s counseling center and 32 have utilized the services of JMU’s sport psychologists. JMU’s counseling center offers a wide array of services, including individual and group counseling, treatment programs, self care spaces and

workshops, along with consultation, psychiatric, and outreach services. Seventy-four of the respondents felt as though the resources available to student athletes are adequate. When asked what more could be done to help, one said coaches should be more conscious of the emotional and mental strain experienced by student athletes. Another mentioned how there should be end-of-the-year interviews for all athletes rather than just for seniors. This way all team members can have a voice about what could make their program better and share any negatives that may be occurring that year.

Overall, athletes reported that their team's ability to effectively manage conflicts among one another was either "good" or "excellent" (81%). Personalities clash among teammates either not too often or sometimes (79%). Teammates "usually" share the same goals of personal improvement (48%) and "always" share the same goals in competition (63%). Athletes felt as though they could either always or usually trust and rely on their teammates (90%), and although there was often competition between them (58%), this competition was either always or usually healthy 99% of the time. Athletes also felt as though their coaches did a "good" or "excellent" job managing conflicts among team members (69%), and that for the most part they could trust their coaches with personal issues and rely on them to work in their best interests (82%). Fifty-seven athletes (68%) reported that others on their team were always or usually treated fairly and equally and 70 (83%) reported that they themselves were always or usually treated fairly. Thirty-nine (46%) said they felt as though they had tremendous support from their coaching staff and only one (1%) said they had none at all. Whereas 29 (35%) said they felt they had tremendous support from their advisor and 12(14%) said they had none at all. Half the athletes (42) said they felt they only had "some" support from their professors. The vast majority (92%) felt as though they had tremendous support from their families.

To determine whether or not the students displayed evidence of anxiety and depression, the answer choices were coded into SPSS as “Not at all” = 0, “Several days” = 1, “More than half the days” = 2, and “Nearly everyday” = 3. The sums were totaled and categorized based on predetermined scales. Levels of anxiety were categorized as follows: 0-4 minimal anxiety, 5-9 mild anxiety, 10-14 moderate anxiety, 15-21 severe anxiety. Levels of depression were categorized similarly: 1-4 minimal depression, 5-9 mild depression, 10-14 moderate depression, 15-19 moderately severe depression, 20-27 severe depression.

Those with moderate or severe anxiety were re-coded as having anxiety for the inference tests, and those with moderate to severe depression were classified as having depression. A chi square test was then used to determine whether there was a significant association between particular team characteristics and symptoms of poor mental health. Review of the results of the chi square test revealed numerous significant correlations, which are bolded in red in the table in Table 1 below.

Table 1. Chi Square Tests on Team Characteristics with Anxiety and Depression

	Anxiety		Depression	
	Chi Square	Significance	Chi Square	Significance
Hours a week spent training	21.997	.128	14.263	.768
Hours a day spent training	17.188	.577	13.822	.741
Intensity of practices	.704	.872	2.800	.424
Enough time to rest and recover from practice	5.117	.276	7.540	.110
Hours per week spent travelling for competition	21.226	.816	21.293	.772
Enough time to rest and recover from travel	1.205	.877	4.630	.327
Enough time to rest and recover from competition	.644	.958	3.949	.413
Enough time for a social life	7.484	.112	16.182	.003

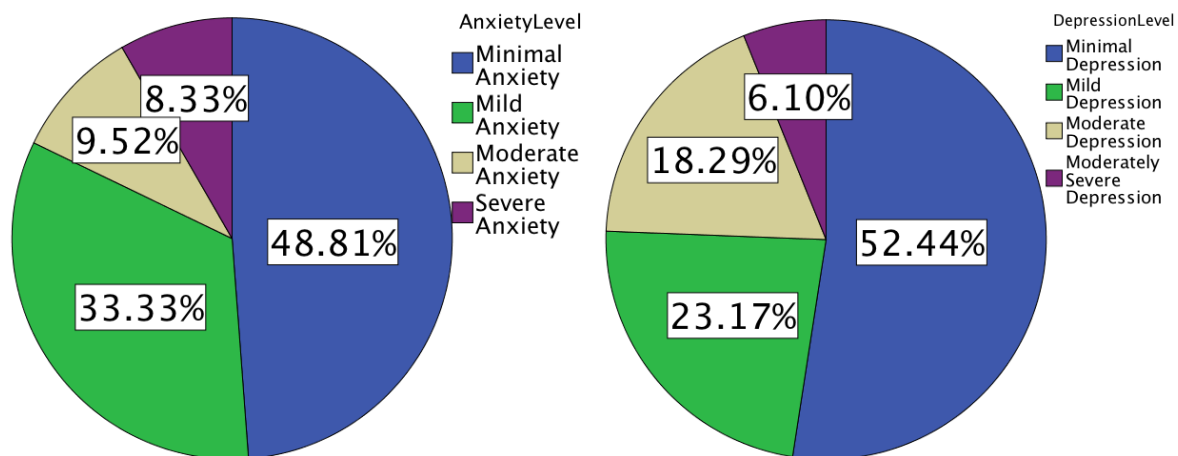
Feelings of pressure	13.403	.009	5.590	.232
Significant injuries	3.268	.071	4.325	.038
Team's ability to effectively manage conflicts	3.175	.365	13.399	.004
Clashed personalities	6.160	.188	8.901	.064
Shared goals of personal improvement	14.986	.002	4.130	.248
Shared goals in competition	3.108	.375	2.362	.501
Trust and reliability of teammates	10.275	.016	3.756	.289
Competition between teammates	1.104	.776	2.129	.546
Coach's ability to effectively manage conflict within team	4.804	.308	2.619	.623
Trust and reliability of coach	2.568	.632	3.767	.438
Assistant Coach's ability to effectively manage conflict	5.228	.265	4.597	.331
Trust and reliability of assistant coach	3.502	.478	2.058	.725
Belief that team members are treated fairly	3.128	.372	1.502	.682
Believe that individual is treated fairly	3.121	.538	2.700	.609
Emotional support from coaching staff	.963	.810	.531	.912

The significance level, or probability that the correlation wasn't due to chance, was found for each comparison along with Pearson's Chi Square. The tests were run at an alpha level of .05. The results revealed a significant correlation ($X^2 = 16.183$, $p = .003$) between students feeling as though they had 'enough time for a social life' and depression, with those who felt as though they didn't have enough time for life outside their sport more likely to experience depressive symptoms. There was also a significant correlation ($X^2 = 13.403$, $p = .009$) identified between 'feelings of pressure' and anxiety, with more pressure leading to increased risk. The numeric data for injured athletes supports the conclusions made from the written responses in that those who were hurt and unable to play were more likely to experience depression ($X^2 = 4.325$, $p = .038$). Those who felt as though their team could not effectively manage conflicts amongst each other were also more likely to be depressed ($X^2 = 13.399$, $p = .004$). Two other team characteristics that led to increased symptoms of anxiety were 'not having shared goals of

personal improvement' ($X^2 = 14.986$, $p = .002$), and athletes 'not feeling as though they were able to trust or rely on their teammates.'

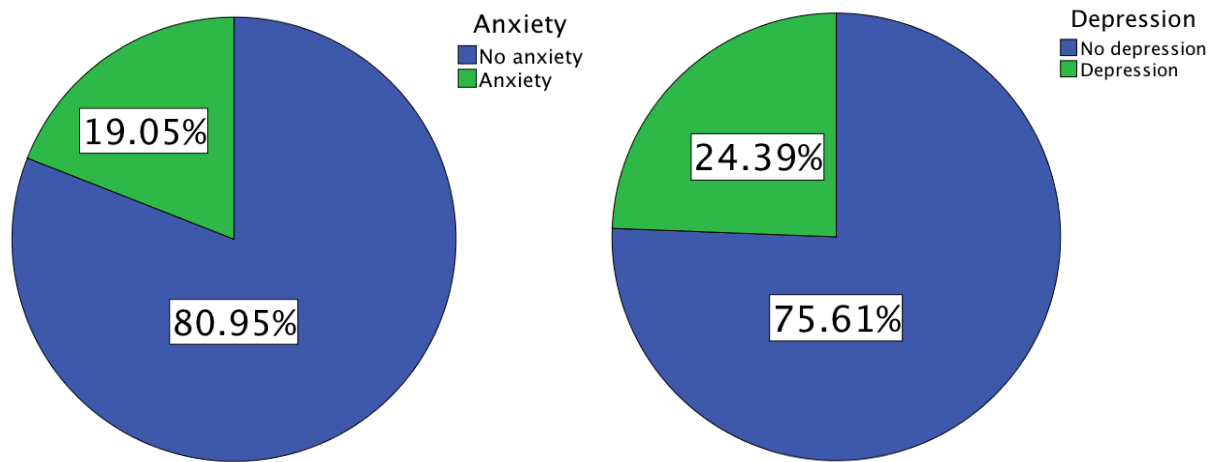
For both depression and anxiety, the students were categorized based on the scale as to whether their symptoms exhibited signs of minimal, mild, moderate, or severe anxiety and depression. The majority of participants experienced minimal depressive and anxiety symptoms. No athletes rated as having severe depression. The frequencies of students in each level are shown in Figure 2.

Figure 2. Anxiety and Depression Levels



In order to do the chi square test, the results were dummy coded so that those with minimal and mild anxiety and depression were labeled as “No” while those with moderate and severe anxiety and depression were labeled as “Yes.” Pie charts for the new classifications are shown in Figure 2.

Figure 3. Presence of Anxiety and Depression



Discussion

Although the number of respondents to the complete survey is under a quarter of the total number of student athletes who were emailed (N=433), the respondents varied across the different types of sports and could be considered fairly generalizable to the thoughts and feelings of the student athlete population at JMU as a whole. According to previous research, 65% of college students reported severe sadness, while 58.4% reported overwhelming anxiety. In comparison, the proportion of the student athletes surveyed actually reported lower prevalence of depression and anxiety. This may be surprising, considering the extensive time demands and public scrutiny placed on this subset of the population who must balance the roles of being a full time student and full-time athlete (Kissinger & Miller, 2009). Between performance pressure, lack of sleep, missing classes, handling team tensions, and balancing schoolwork, student athletes possess responsibilities that often greatly surpass those of their non-athlete counterparts (Kamusoko & Pemberton, 2012).

As stated in the literature, the majority of student athletes reported that the demands of intercollegiate athletic training and competition have prevented them from being able to devote as much time to the student side of their lives as they would like (Jolly, 2007). Significant associations from this exploratory study revealed that athletes may feel as though they don't have enough time for a social life either, and this is leading to negative health outcomes of depression. In addition, responses to questions regarding injuries, specifically those that resulted in time spent away from sport, heavily supported existing literature suggesting that these medical issues resulted in emotional distress, negatively affecting the athlete's self esteem and identity (Thompson & Trattner Sherman, 2007). Common consequences of injury noted in this study were frustration over having to change playing style or inability to contribute to the successes of the team, stress over trying to keep up both athletically and academically, depression, and lowered confidence. A few did however mention newfound appreciation for their ability to play and motivation to work harder.

Previous research suggested that students who play sports with competition based on individual performance might be at increased risk for depression, possibly due to internal attribution of failure, feelings of guilt or shame since they do not have teammates to credit for negative results (Nixdorf, Frank, & Beckmann, 2016). Despite the literature, this study did not find any significant correlations on the basis of sport type, or any of the other demographic variables; gender, race, residence, year in school, or qualification for financial aid. It is possible that this lack of detectable association was due to non-participation bias, in which not all subgroups were adequately represented.

While many studies have looked at the effects of these demographic variables on depression and anxiety, the idea of looking at team characteristics is novel. The survey asked

questions about the dynamic of each sports team, such as whether personalities clashed, whether all team members were treated fairly, and whether there was any unhealthy competition amongst players. Analysis discovered that those who felt their team did not share the same goals of personal improvement, and those who felt as though they couldn't trust their teammates had increased likelihood of experiencing anxiety. In addition, those who felt that their team could not effectively manage conflicts among one another had an increased likelihood of experiencing depression. There was an association between utilization of a JMU sports psychologist and anxiety, likely because those who are anxious and put extra pressure on themselves in regards to their sport might seek professional help.

This study had several strengths. It was crucial that the athletes were aware and trusted that their participation in the survey was anonymous in order for them to be completely truthful in their answers. The promise of anonymity helped ensure the validity of the resulting data, in addition to allocation of all control variables. The use of peer-reviewed literature to inform its creation, as well as the use of valid anxiety and depression screenings helped ensure the reliability of the study. However, this study had several limitations. One possible issue with the study was response bias, as those athletes who felt strongly about the issue or who struggle more with their mental health may have been more inclined to fill out the survey. To counteract this, the study attempted to obtain as many participants as possible by sending to all 433 athletes. However, due to low response rate ($N = 84$), some comparisons deemed insignificant may have been significant had the sample size been larger. If there were any particular differences between those who did and did not partake in the study this could have led to non-participation bias, which could potentially skew the results one way or another and make it less reliable. In addition, despite promised anonymity of the survey, there is always a chance that the effects of

social desirability could have led to a misrepresentation of true feelings, causing a mismatch between the results of this study and the outcomes expected based on the literature. One example of suspicious answers was in questions asking about whether competition occurred amongst team members, and whether the competition was always healthy. According to the data, 99% reported that the competition was either “always” or “usually” healthy. Based on the first-hand experience of the principle investigator of this study, these responses are likely either due to a glitch in Qualtrics or students wanting themselves and their teammates to be viewed favorably.

Future research should compare the depressive and anxiety of student athletes versus non-student athletes in order to see if playing a sport puts you more or less at risk for those negative mental health outcomes. This is an important aspect to explore because if individual student athletes are suffering, the team as a whole will be affected, which would hinder optimal performance. Coaches should work with athletic programs to support their well-being. It would also be interesting to compare across different groups on campus in addition to athletes, for example those who participate in Greek Life or those who are members of the Honors College. Again, it is vital that any group with an increased risk for poor mental health due to their affiliations are supplied with sufficient resources for them to get the help they need.

Ultimately, mental well-being is a crucial aspect of student athletes success in their sport, and any individual issues have a major impact the team as a whole. Fortunately, JMU appears to sufficiently support their athletes, with 18% visiting JMU’s counseling center, 38% using the sports psychologist, and 88% feeling as though the resources available to them are adequate.

Appendix A

“Hi Coach.

My name is Dylan Owens, a senior player on the women’s tennis team here at JMU. I am currently working on my Honors Capstone Project, looking at health and wellbeing among student athletes. In addition to using the information I gain for my graduation requirement, I am hoping to give back to the university by providing any useful information to Student Athletics with the long-term goal of continuing to support the promotion of wellbeing among our athletes. I am requesting your permission to e-mail out a questionnaire I have developed (link attached). If you could encourage your players to fill it out it would be greatly appreciated. I would also like to email them directly and encourage students to fill out the survey. All data collected will be completely anonymous, and everyone who participates will be entered into a raffle for a \$25 gift card. Please let me know if you have any other questions about my research project.

Thank you so much, Dylan.”

Appendix B:

“Dear Student-Athlete.

My name is Dylan Owens, a senior player on the women’s tennis team here at JMU. I am currently working on my Honors Capstone Project, looking at health and wellbeing among student athletes. I am hoping that you can help me with my project, by taking a short anonymous survey. Everyone who finishes the survey will be entered into a raffle for a \$25 gift card. This study has a long-term goal of improving support systems and promoting wellbeing among student athletes like yourself in the future. Please don’t hesitate to email me directly if you have any other questions about my research project.

Thank you so much, Dylan.”

Appendix C:

What individual factors are associated with experience of depression and anxiety symptoms among student athletes?

1. What is your sex?

- a. Male
- b. Female

2. Do you play an individual sport? (This is a sport where someone may medal, or have a standing as an individual. Examples of an individual sport include cross-country, golf, swim and dive, tennis, track and field).

- a. Yes
- b. No

3. Are you of Latino or Hispanic descent?

- a. Yes
- b. No

4. Which racial category do you identify with?

- a. African-American/ Black
- b. American Indian/ Native Alaskan
- c. Asian/ Pacific Islander
- d. Caucasian/ White
- e. Multiracial
- f. Other

5. Do you qualify for federal work-study program?

- a. Yes

- b. No

6. Are you a(n) (choose one):

- a. In-state student
- b. Out-of-state student
- c. International student

What academic characteristics are associated with experience of depression and anxiety symptoms among student athletes?

1. What year in school are you?

- a. Freshman
- b. Sophomore
- c. Junior
- d. Senior
- e. 5th year or above

2. Do you have an athletic scholarship to play and compete?

- a. Full (covering total tuition, books, housing etc.)
- b. Partial (covering a portion of total tuition)
- c. None

3. Do you have an academic scholarship not related to your status as a student athlete?

- a. Full (covering total tuition, books, housing etc.)
- b. Partial (covering a portion of total tuition)
- c. None

4. About how many hours a week do you spend studying for our current classes?

{students may select a number between 0 and 40}

5. Do you feel as though you can comprehend your current coursework without difficulty?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

6. Are you confident in your ability to receive A's in your current coursework?

- a. Yes
- b. Somewhat
- c. No

7. Do you utilize the tutoring services provided for student athletes?

- a. Yes
- b. No

8. If yes, on average, how often?

- a. Less than once a week
- b. At least once a week
- c. Two to three times a week
- d. More than three times a week

What student-athlete characteristics are associated with experience of depression and anxiety symptoms among student athletes?

1. How many hours a week on average do you train during season?

{students may select a number between 0 and 40}

2. On average, how many hours of practice do spend per day (including both skills practices and lift/conditioning sessions)?

{students may select a number between 0 and 8}

3. How intense are these practices in terms of physical exertion?

- a. Always physically demanding
- b. Usually physically demanding
- c. Sometimes physically demanding
- d. Not often physically demanding
- e. Never physically demanding

4. Do you feel as though you are given enough time to rest and recover from practice?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

5. How many hours per week (on average) are spent travelling to and from competition during season?

{students may select a number between 0 and 20}

6. How many days per week (on average) are spent on the road during season?

- a. 1
- b. 2

- c. 3
- d. 4
- e. 5

7. Do you feel as though you are given enough time to rest and recover from travel?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

8. Do you feel as though you are given enough time to rest and recover from competition?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

9. Do you feel as though you have enough time for a social life?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

10. Do you feel pressure as a student-athlete?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

11. Have you had any significant injuries or illnesses that impacted your ability to play?

- a. Yes
- b. No

12. If yes, has your injury resulted in time away from your sport?

- a. Yes
- b. No

13. If yes, how much time?

- a. Less than a week
- b. 1-4 weeks
- c. 1-6 months
- d. 7-12 months
- e. More than a year

14. Has your injury caused you any emotional distress?

- a. Yes
- b. No

15. If yes, in what ways has your injury affected you?

{ open-ended question }

What team dynamics characteristics are associated with experience of depression and anxiety symptoms among student athletes?

1. In your opinion, how is your team's ability to effectively manage conflicts between one another?

- a. excellent
- b. good
- c. average
- d. fair
- e. poor

2. Do personalities clash within your team?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

3. Does everyone on your team share the same goals of personal improvement?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

4. Does everyone on your team share the same goals in competition?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

5. Do you feel as though you can trust and rely on your teammates?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

6. Is there competition between you and your teammates?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

7. Is the competition healthy?

- a. Healthy
- b. Usually healthy
- c. Usually unhealthy
- d. Unhealthy

8. How would you rate your coaches ability to effectively manage conflict within the team?

- a. excellent
- b. good
- c. average
- d. fair
- e. poor

9. Do you feel as though you can trust your coach with personal issues and rely on him or her to work for your best interests?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

10. How would you rate your assistant coaches ability to effectively manage conflict within the team?

- a. excellent
- b. good
- c. average
- d. fair
- e. poor

11. Do you feel as though you can trust your coach with personal issues and rely on him or her to work for your best interests?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

12. Do you believe others on your team are treated fairly and equally?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

13. Do you believe that you specifically are treated fairly?

- a. Yes, always
- b. Usually
- c. Sometimes
- d. Not often
- e. No, never

14. How much emotional support do you feel you have from the coaching staff?

- a. tremendous support
- b. some support
- c. little support
- d. no support

15. How much emotional support do you feel you have from your advisor?

- a. tremendous support
- b. some support
- c. little support
- d. no support

16.. How much emotional support do you feel you have from your professors?

- a. tremendous support
- b. some support
- c. little support
- d. no support

17. How much emotional support do you feel you have from your friends?

- a. tremendous support
- b. some support
- c. little support
- d. no support

18. How much emotional support do you feel you have from your family?

- a. tremendous support
- b. some support
- c. little support
- d. no support

19. Have you ever utilized JMU's counseling center for emotional support?

- a. Yes
- b. No

20. Have you ever utilized the services of sports psychologist here at JMU?

- a. Yes
- b. No

21. Do you feel the resources available to you are adequate?

- a. Yes
- b. Somewhat
- c. No

22. If no or somewhat, what more do you think could be done to help you?

{ open-ended question }

Are JMU's students-athletes experiencing high levels of anxiety?

Anxiety Screening from Mental Health America

1. Feeling nervous, anxious, or on edge

- a. Not at all
- b. Several days
- c. More than half the days
- d. Nearly every day

2. Not being able to sleep or control worrying

- a. Not at all
- b. Several days
- c. More than half the days
- d. Nearly every day

3. Worrying too much about different things

- a. Not at all
- b. Several days
- c. More than half the days
- d. Nearly every day

4. Trouble relaxing

- a. Not at all
- b. Several days
- c. More than half the days
- d. Nearly every day

5. Being so restless that it is hard to sit still

- a. Not at all
- b. Several days
- c. More than half the days
- d. Nearly every day

6. Becoming easily annoyed or irritable

- a. Not at all
- b. Several days
- c. More than half the days
- d. Nearly every day

7. Feeling afraid, as if something awful might happen

- a. Not at all
- b. Several days
- c. More than half the days
- d. Nearly every day

Are JMU's students experiencing high levels of depression?

Depression Screening from Mental Health America

1. Little interest or pleasure in doing things

- a. Not at all
- b. Several days

- c. More than half the days
- d. Nearly every day

2. Feeling down, depressed, or hopeless

- a. Not at all
- b. Several days
- c. More than half the days
- d. Nearly every day

3. Trouble falling or staying asleep, or sleeping too much

- a. Not at all
- b. Several days
- c. More than half the days
- d. Nearly every day

4. Feeling tired or having little energy

- a. Not at all
- b. Several days
- c. More than half the days
- d. Nearly every day

5. Poor appetite or overeating

- a. Not at all
- b. Several days
- c. More than half the days
- d. Nearly every day

6. Feeling bad about yourself - or that you are a failure or have let yourself or your family down

- a. Not at all
- b. Several days
- c. More than half the days
- d. Nearly every day

7. Trouble concentrating on things, such as reading the newspaper or watching television

- a. Not at all
- b. Several days
- c. More than half the days
- d. Nearly every day

8. Moving or speaking so slowly that other people could have noticed

Not at all

- a. Several days
- b. More than half the days
- c. Nearly every day
- d. Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual

9. Thoughts that you would be better off dead, or of hurting yourself

- a. Not at all
- b. Several days
- c. More than half the days
- d. Nearly every day

10. If you checked off any problems, how difficult have these problems made it for you at work, home, or with other people?

- a. Not difficult at all
- b. Somewhat difficult
- c. Very difficult
- d. Extremely difficult

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